

*Sub D1* *Sub A1* *Sub B1*

**What Is Claimed Is:**

1. A method for adjusting a performance parameter of a head suspension, comprising the step of scanning a predetermined region of the head suspension with a laser to impart heat to the region and adjust the performance parameter of the head suspension.
2. The method of claim 1, wherein the performance parameter of the head suspension is the static attitude of the head suspension, with the step of scanning the head suspension selectively adjusting at least one of the pitch and roll static attitude.
3. The method of claim 2, wherein the step of scanning the head suspension includes scanning a first scan region in a first spring arm of a flexure of the head suspension.
4. The method of claim 3, further including the step of scanning a second scan region of the head suspension with the laser beam to impart heat energy to the second scan region.
5. The method of claim 4, wherein the scan region is located in a second spring arm of the head suspension flexure.
6. The method of claim 5, wherein the step of scanning the first and second scan regions with a laser beam includes scanning a plurality of lines in the first and second scan regions.
7. The method of claim 6, wherein each of the plurality of lines scanned in the first and second scan regions extend substantially across the width of the first and second spring arms, respectively, the plurality of lines being substantially parallel to a transverse axis of the head suspension,

the scanning of the plurality of lines causing the spring arms to warp by an angular amount about the transverse axis at the first and second scan regions.

8. The method of claim 7, wherein the first scan region and the second scan region are located in a top surface of the flexure spring arms.

5 9. The method of claim 7, wherein the first scan region and the second scan region are located in a bottom surface of the flexure spring arms.

10 10. The method of claim 7, wherein the first scan region is located in a first surface of the flexure at the first spring arm, and wherein the 10 second scan region is located in a second surface of the flexure that is opposite the first surface of the flexure at the second spring arm.

11. The method of claim 2, wherein the step of scanning the head suspension includes scanning a first scan region located in a cross piece at the distal end of a head suspension flexure, the first scan region being 15 adjacent and spaced apart in a first direction from a longitudinal axis of the head suspension.

12. The method of claim 11, further including the step of scanning a second scan region located in the cross piece of the flexure with the laser beam, the second scan region being adjacent and spaced apart in a second 20 direction that is opposite the first direction from the longitudinal axis of the head suspension.

13. The method of claim 12, wherein the step of scanning the first and second scan regions with the laser beam includes scanning a plurality of lines in the first and second scan regions.

14. The method of claim 13, wherein each of the plurality of lines substantially extend across the width of the cross piece, each of the plurality of lines being substantially parallel to the longitudinal axis of the head suspension, the scanning of the plurality of lines causing the cross piece 5 to warp by an angular amount about the longitudinal axis at the first and second scan regions.

15. The method of claim 14, wherein the first scan region is located on a first surface of the cross piece and the second scan region is located on a second surface that is opposite the first surface of the flexure.

10 16. The method of claim 14, further including the steps of:  
scanning a plurality of lines in a third scan region of the head suspension, the third scan region located in a first spring arm of the head suspension flexure; and  
scanning a plurality of lines in a fourth scan region of the head 15 suspension, the fourth scan region located in a second spring arm of the head suspension flexure;

wherein the plurality of lines scanned in the third and fourth scan regions are scanned substantially across the width of the first and second spring arms, the plurality of lines scanned in the third and fourth scan regions being parallel to a transverse axis of the head suspension, the scanning of the plurality of lines in the third and fourth scan regions causing the third and fourth scan regions to warp by an angular amount about the transverse axis of the head suspension.

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17. The method of claim 1, wherein the step of scanning the head suspension includes controllably scanning the head suspension to effect a desired amount of static attitude correction.
18. The method of claim 17, wherein the step of controllably scanning the head suspension includes determining the amount of scanning necessary to effect a desired angular deflection from stored data describing the relationship between angular deflection and the amount of scanning performed.
19. The method of claim 18, wherein the relationship between the angular deflection and the amount of scanning is determined as a function of the number of scan lines scanned in the head suspension.
20. A method for providing a precise adjustment to the static attitude of a head suspension, comprising the steps of:
  - 15 performing a coarse static attitude adjustment to the head suspension, including the step of scanning a scan region of the head suspension with a laser beam to warp the scan region;
  - measuring the static attitude of the head suspension after the coarse static attitude adjustment; and
  - 20 performing a fine static attitude adjustment to the head suspension, including the step of scanning the scan region of the head suspension a second time with the laser beam, the second scanning of the scan region causing the scan region to warp an additional amount that is less than the amount of warp caused by the coarse static attitude adjustment.

21. The method of claim 20, wherein the step of scanning the scan region the first time comprises scanning a first plurality of scan lines in the scan region, and the step of scanning the scan region the second time comprises scanning a second plurality of scan lines in the scan region.

5 22. The method of claim 21, wherein the step of performing a coarse static attitude adjustment further includes the steps of:

determining the pitch error between a desired pitch static attitude and the measured pitch static attitude of the head suspension;

10 determining the roll error between the desired roll static attitude and the measured roll static attitude of the head suspension;

determining the location of at least one scan region on the head suspension to compensate for one of the pitch error and roll error; and

15 predicting the number the first plurality of scan lines necessary to compensate for a portion of the one of the pitch error and roll error.

23. The method of claim 22, wherein the step of predicting the number of the first plurality of scan lines necessary to compensate for a portion of one of the pitch error and the roll error comprises calculating the 20 number of scan lines from at least one response curve depicting coarse static attitude adjustment as a function of the number of scan lines for the one of the pitch error and the roll error.

24. The method of claim 23, wherein the portion of the one of the pitch and roll errors comprises greater than about eighty percent of the

total one of the pitch and roll error between the desired static attitude and the measured static attitude.

25. The method of claim 24, wherein the step of performing the coarse static attitude adjustment further includes predicting the number of 5 scan lines necessary to compensate for a portion of the other of the pitch error and the roll error.

26. The method of claim 25, wherein the step of predicting the number of scan lines necessary to compensate for a portion of the other one of the pitch error and the roll error comprises calculating the number of 10 scan lines from at least one response curve depicting coarse static attitude adjustment as a function of the number of scan lines for the other one of the pitch error and the roll error.

27. The method of claim 26, wherein the portion of the other of the pitch error and the roll error comprises greater than about eighty percent 15 of the total other of the pitch error and the roll error between the desired static attitude and the measured static attitude.

28. The method of claim 21, wherein the step of performing a fine static attitude adjustment further includes the steps of:

determining the pitch error between a desired pitch static attitude and 20 the measured pitch static attitude provided by the head suspension after the coarse static attitude adjustment;

determining the roll error between a desired roll static attitude and the measured roll static attitude provided by the head suspension after the coarse static attitude adjustment; and

predicting the number of the second plurality of scan lines necessary to compensate for one of the pitch error and the roll error.

29. The method of claim 28, wherein the step of predicting the number of the second plurality of scan lines necessary to compensate for 5 one of the pitch error and the roll error comprises calculating the number of scan lines from at least one response curve depicting fine static attitude adjustment as a function of the number of scan lines for the one of the pitch error and the roll error.

30. The method of claim 29, wherein the step of performing 10 the fine static attitude adjustment further includes predicting the number of scan lines necessary to compensate for the other of the pitch error and roll error.

31. The method of claim 30, wherein the step of predicting the number of scan lines necessary to compensate for the other of the pitch 15 error and the roll error comprises calculating the number of scan lines from at least one response curve depicting fine static attitude adjustment as a function of the number of scan lines for the other of the pitch error and the roll error.

32. The method of claim 21, wherein:  
the step of performing a coarse static attitude adjustment further 20 includes the steps of:  
determining the pitch error between a desired pitch static attitude and the measured pitch static attitude of the head suspension,

determining the roll error between the desired roll static attitude and the measured roll static attitude of the head suspension,

determining the location of at least one scan region on the head suspension to compensate for one of the pitch error and roll error, and

predicting the number the first plurality of scan lines necessary to compensate for a portion of the one of the pitch error and roll error; and

10 the step of performing a fine static attitude adjustment further includes the steps of:

determining the pitch error between a desired pitch static attitude and the measured pitch static attitude provided by the head suspension after the coarse static attitude adjustment;

15 adjustment;

determining the roll error between a desired roll static attitude and the measured roll static attitude provided by the head suspension after the coarse static attitude adjustment; and

predicting the number of the second plurality of scan lines

20 necessary to compensate for one of the pitch error and  
the roll error.

33. The method of claim 32, further including the steps of:

calculating a response factor prior to performing the fine static attitude adjustment, the response factor comprising a ratio between the

estimated angular deflection for the coarse static attitude adjustment and the measured angular deflection for the coarse static attitude adjustment; and

adjusting the number of scan lines for the fine static attitude adjustment consistent with the response factor.

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